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[54] **ROLLER SUNSHADE FOR MOUNTING ON CAR ROOF**

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[51] **Int. Cl.**⁷ **B60J 11/00**

[52] **U.S. Cl.** **160/370.22**; 160/24; 160/301; 248/683; 248/362; 296/98

[58] **Field of Search** 160/370.22, 24, 160/122, 300, 301, 23.1; 296/98, 136, 97.7; 150/166, 168; 248/683, 205.5, 206.2, 206.3, 309.3, 363, 362; 362/397

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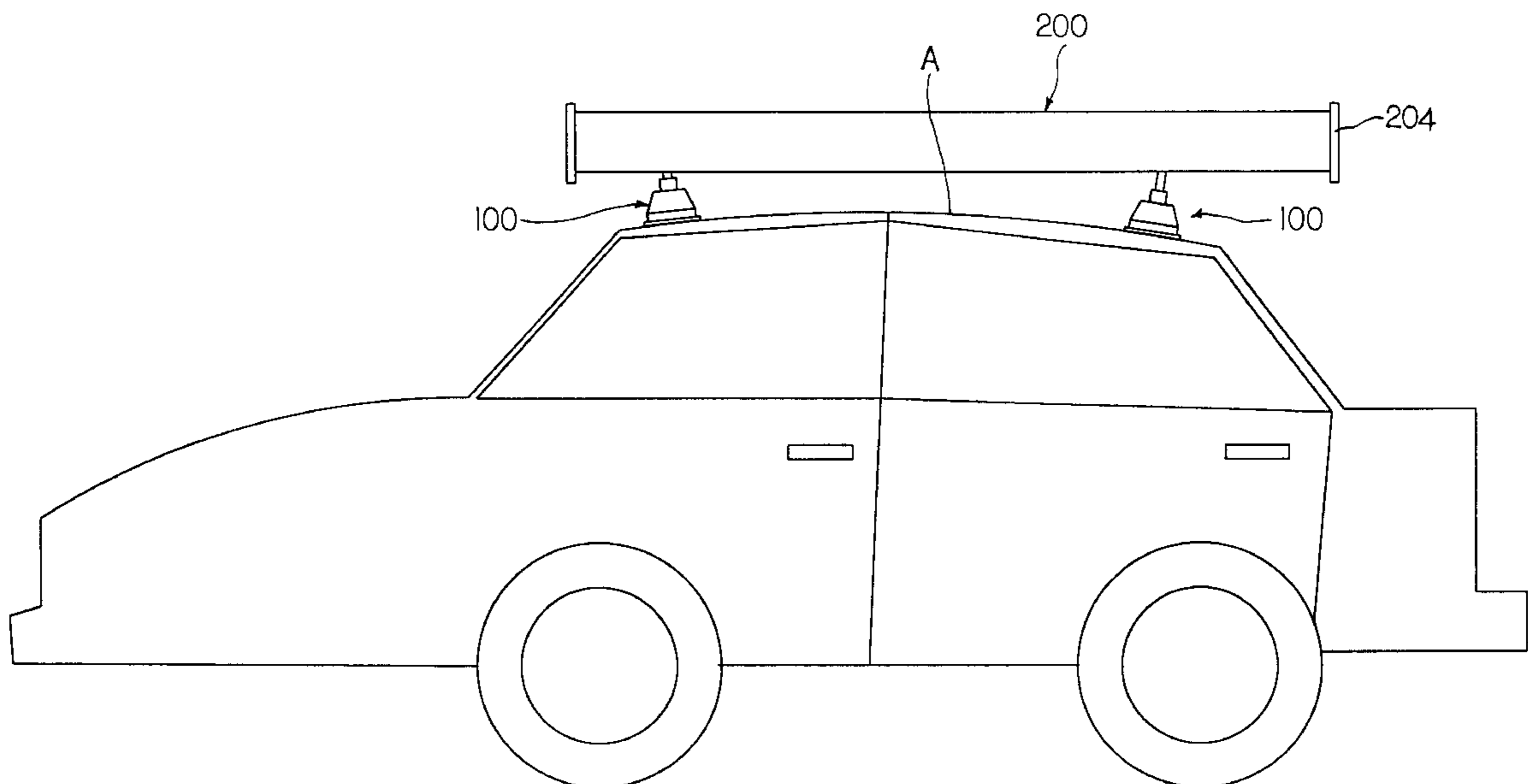
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[57] **ABSTRACT**

A roller sunshade for mounting on a car roof mainly includes more than one adhering sucker mechanism and an automatic sunshade winding mechanism. The adhering sucker mechanism can adhere to any point on the car roof by vacuum suction and each includes form bottom to top a sucker main body, a fixed seat, a height-adjusting fixing bar, a sleeve, a level-adjusting supporting board, a locating block, a bolt, and a connecting board. The automatic sunshade winding mechanism is connected to a top of the more than one adhering sucker mechanism and includes a sunshade cloth wound on a roller provided with a torsional spring, and a braking mechanism connected to one end of the roller. The braking mechanism includes a rotational sleeve connected to the torsional spring and a one-way ratchet. When the sunshade cloth is quickly pulled out, the rotational sleeve is allowed to rotate rapidly, and when the sunshade cloth is slowly pulled or rewound, the ratchet is stuck by a pawl to prevent the rotational sleeve from moving and the sunshade cloth is locked at the extended position.

8 Claims, 7 Drawing Sheets



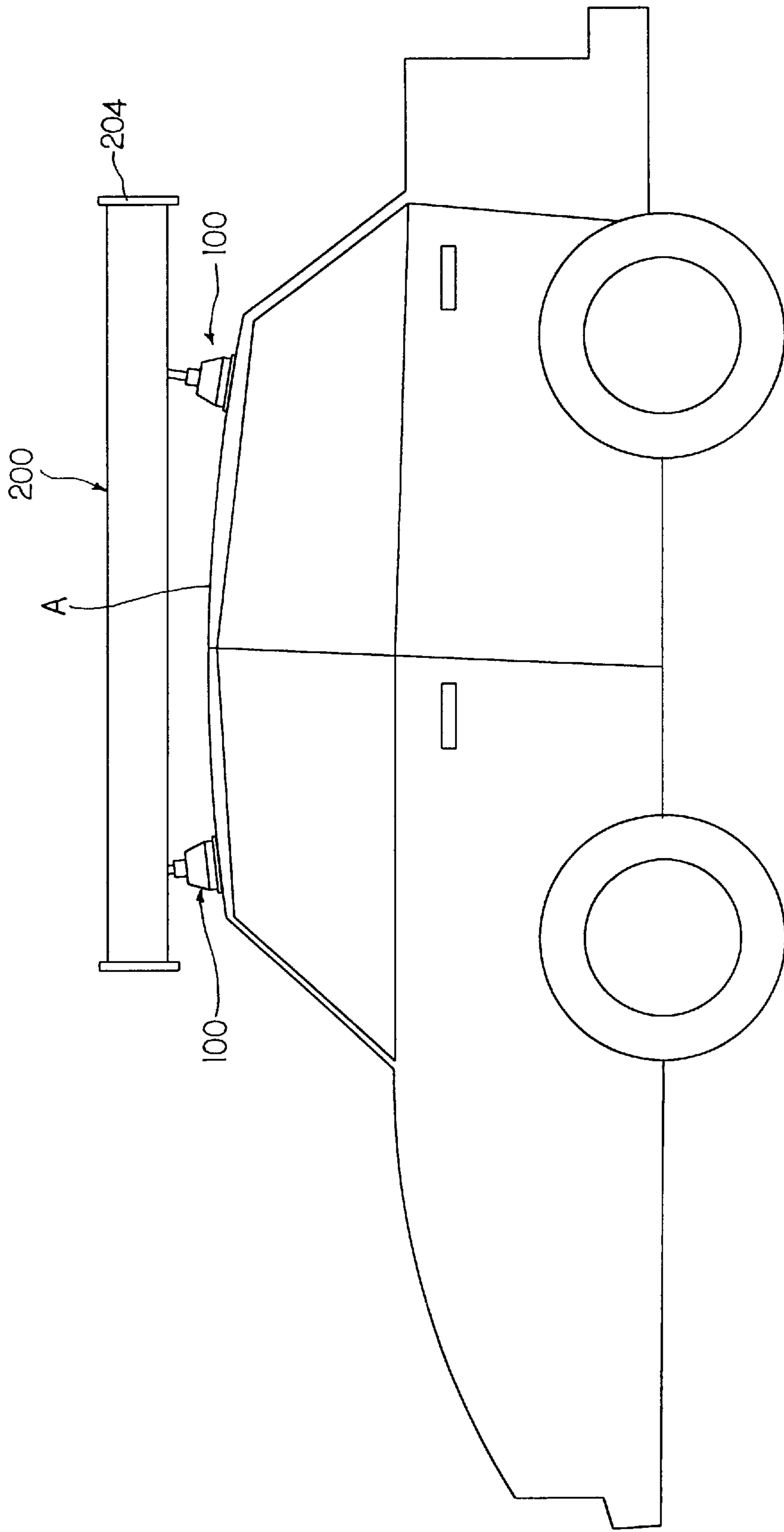


FIG. 1

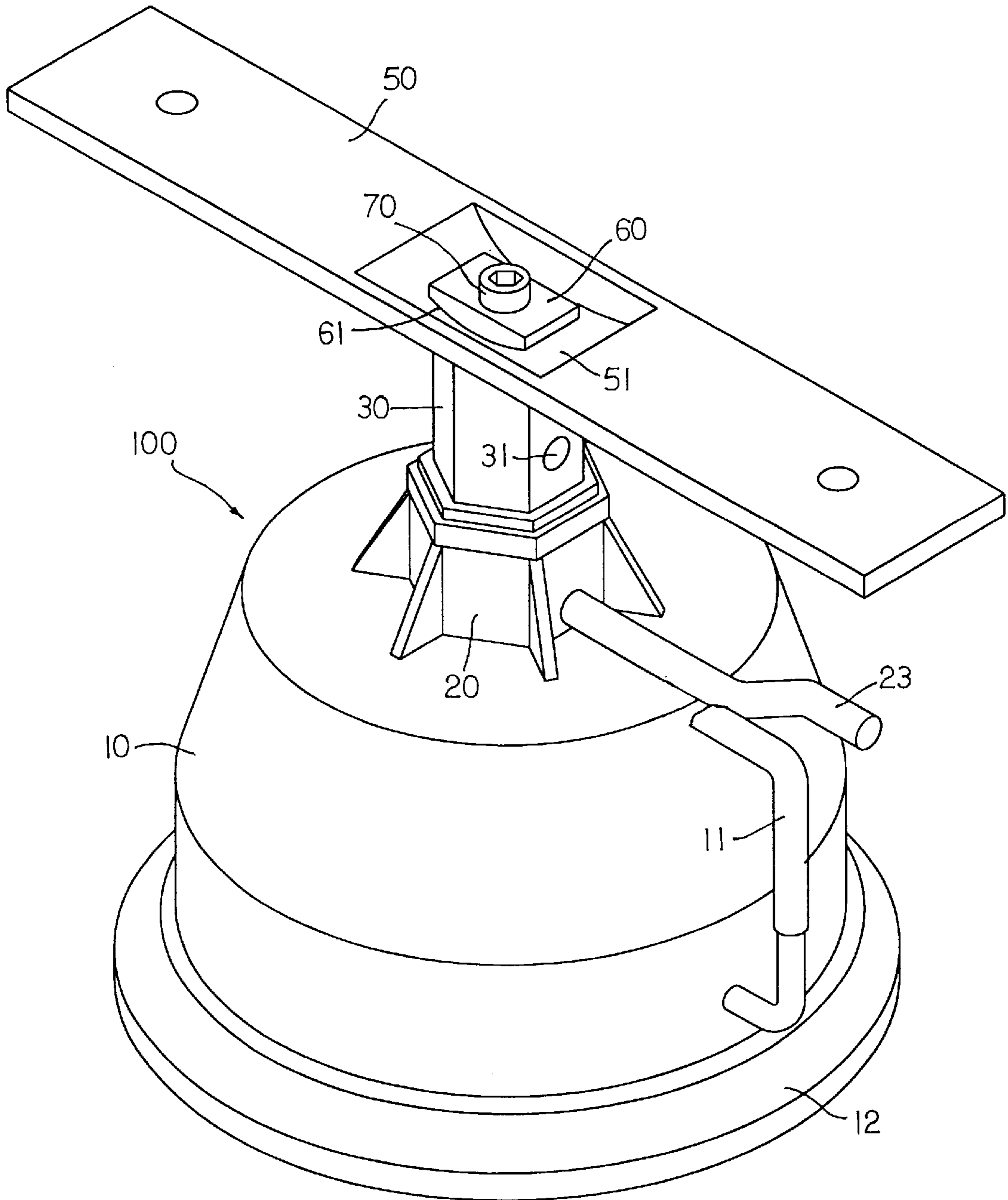


FIG. 2

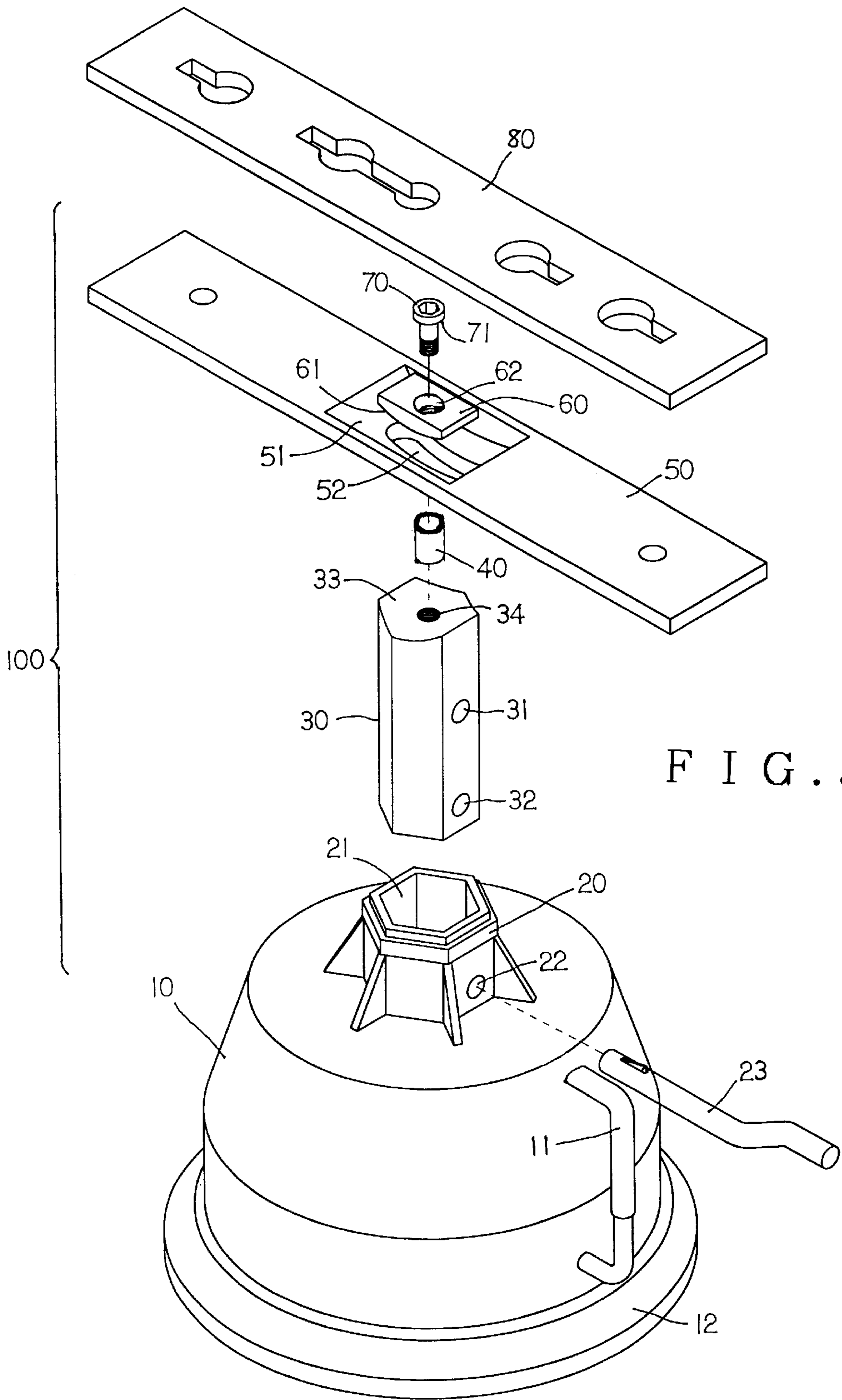


FIG. 3

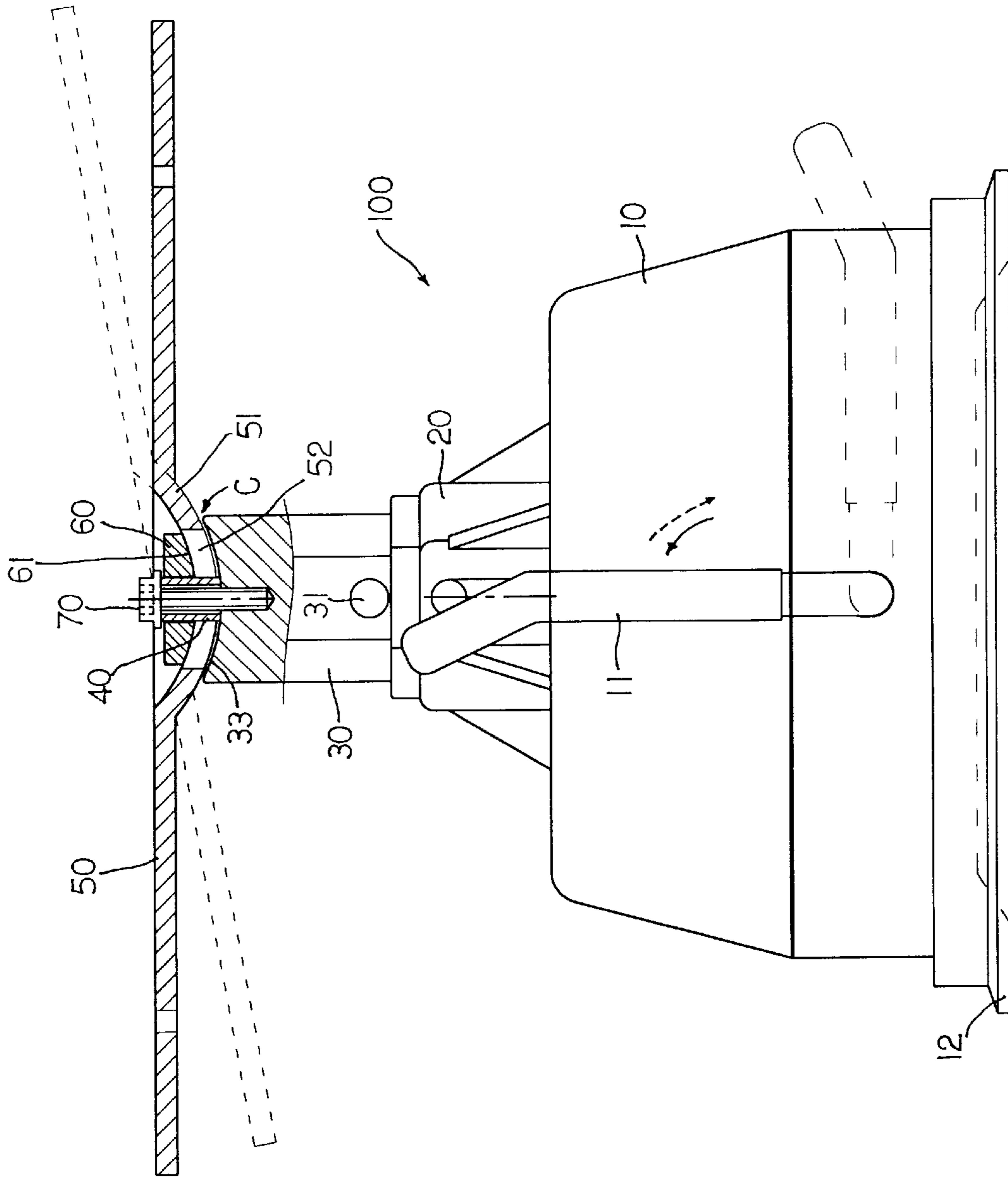


FIG. 4

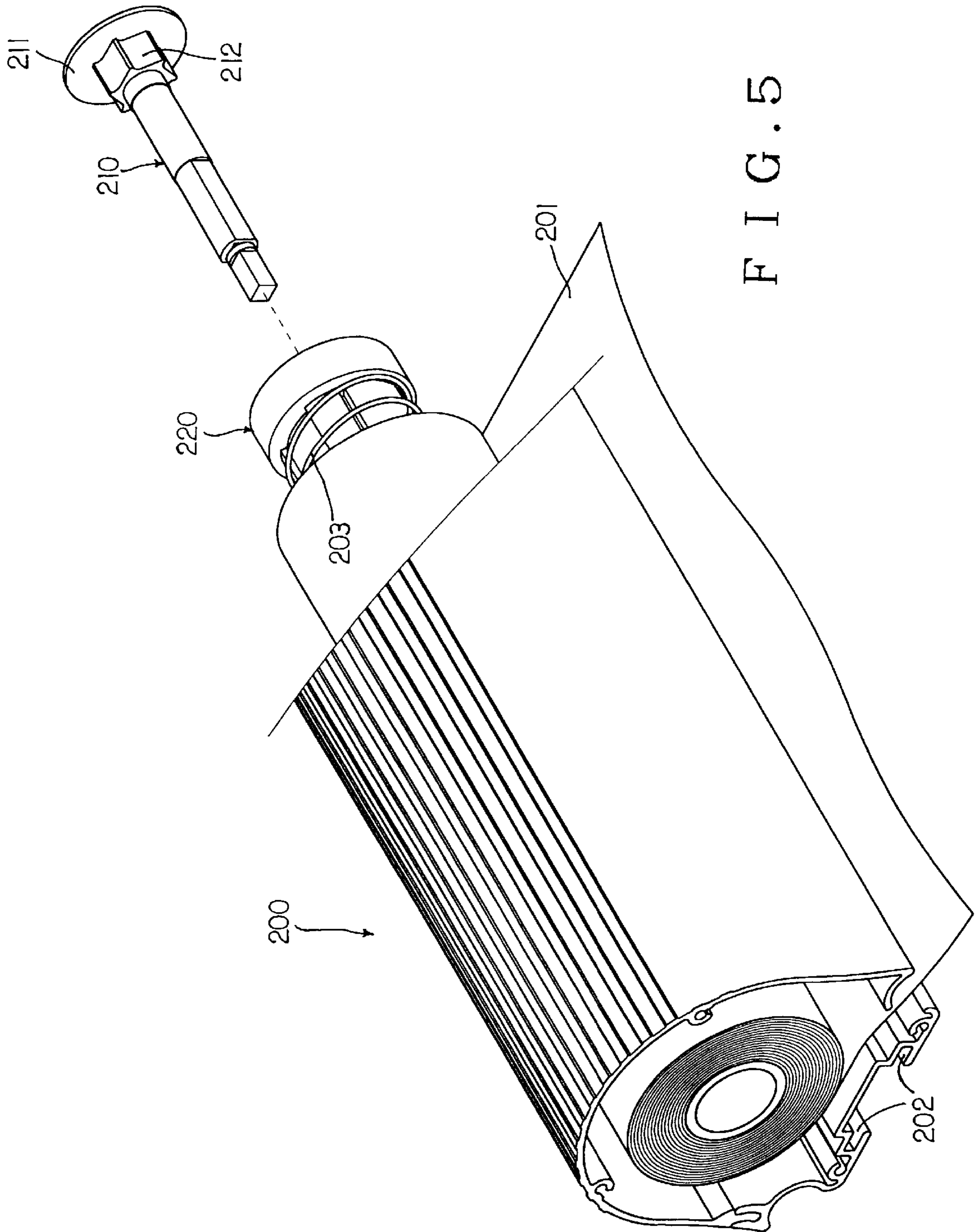


FIG. 5

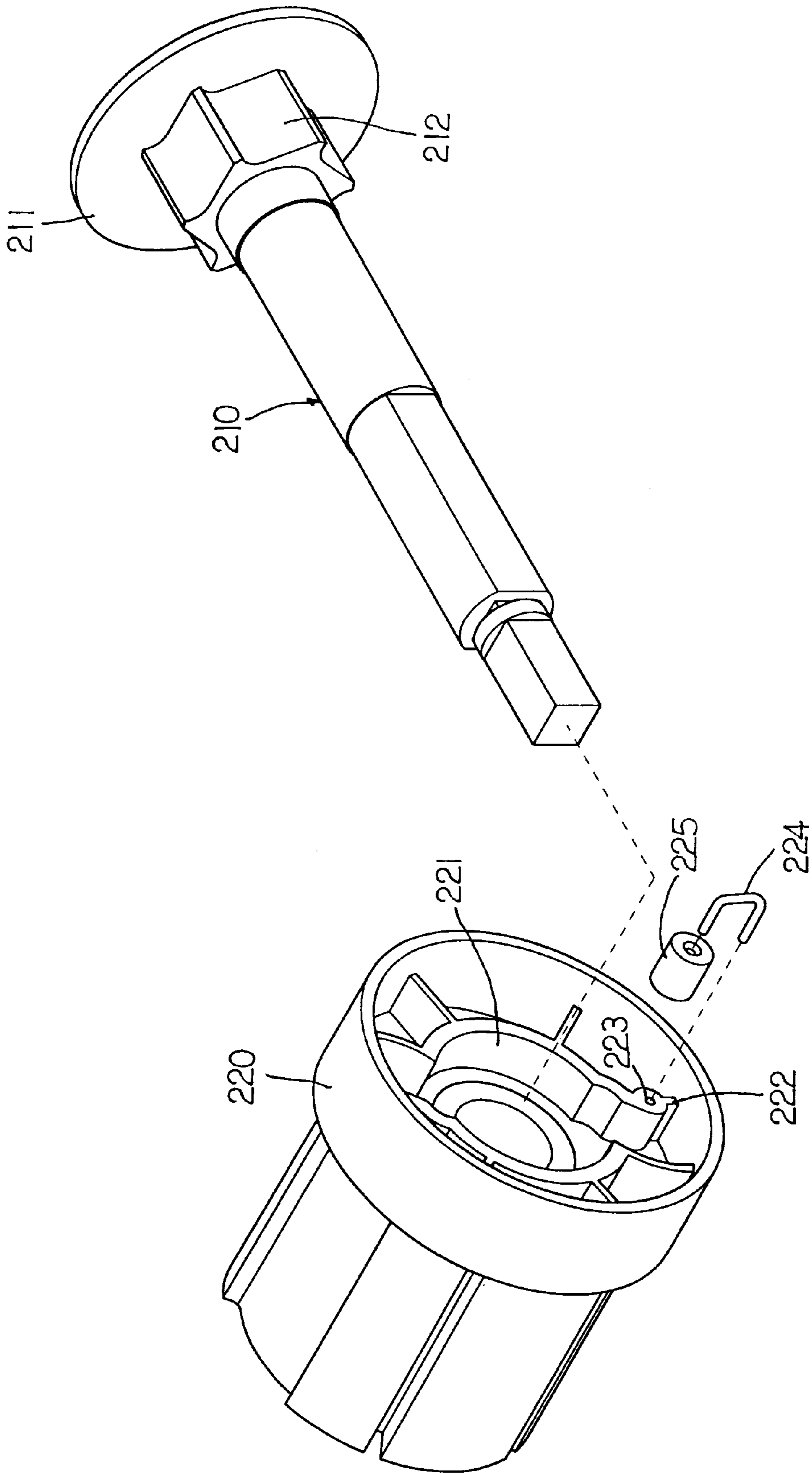


FIG. 6

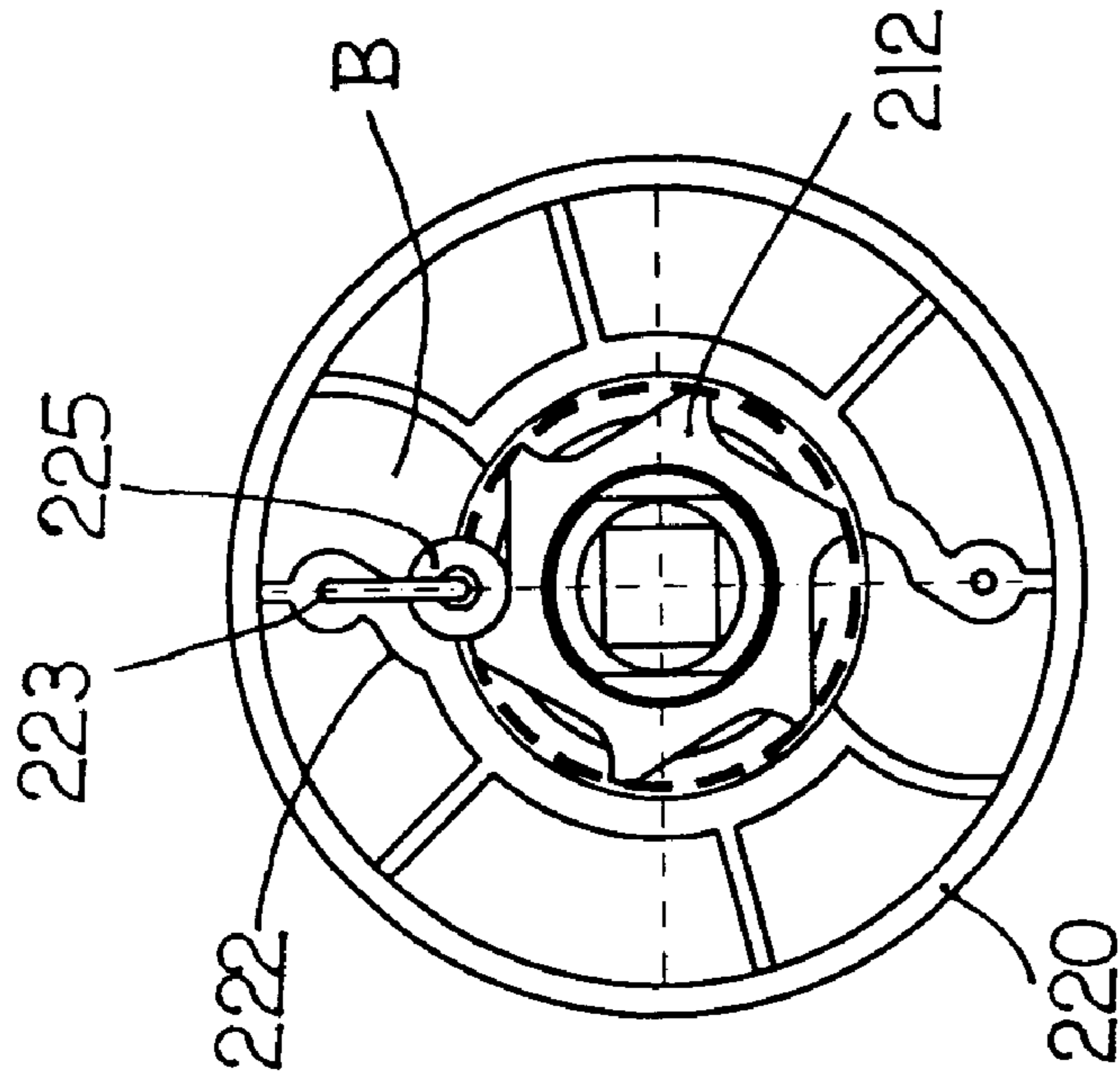


FIG. 7

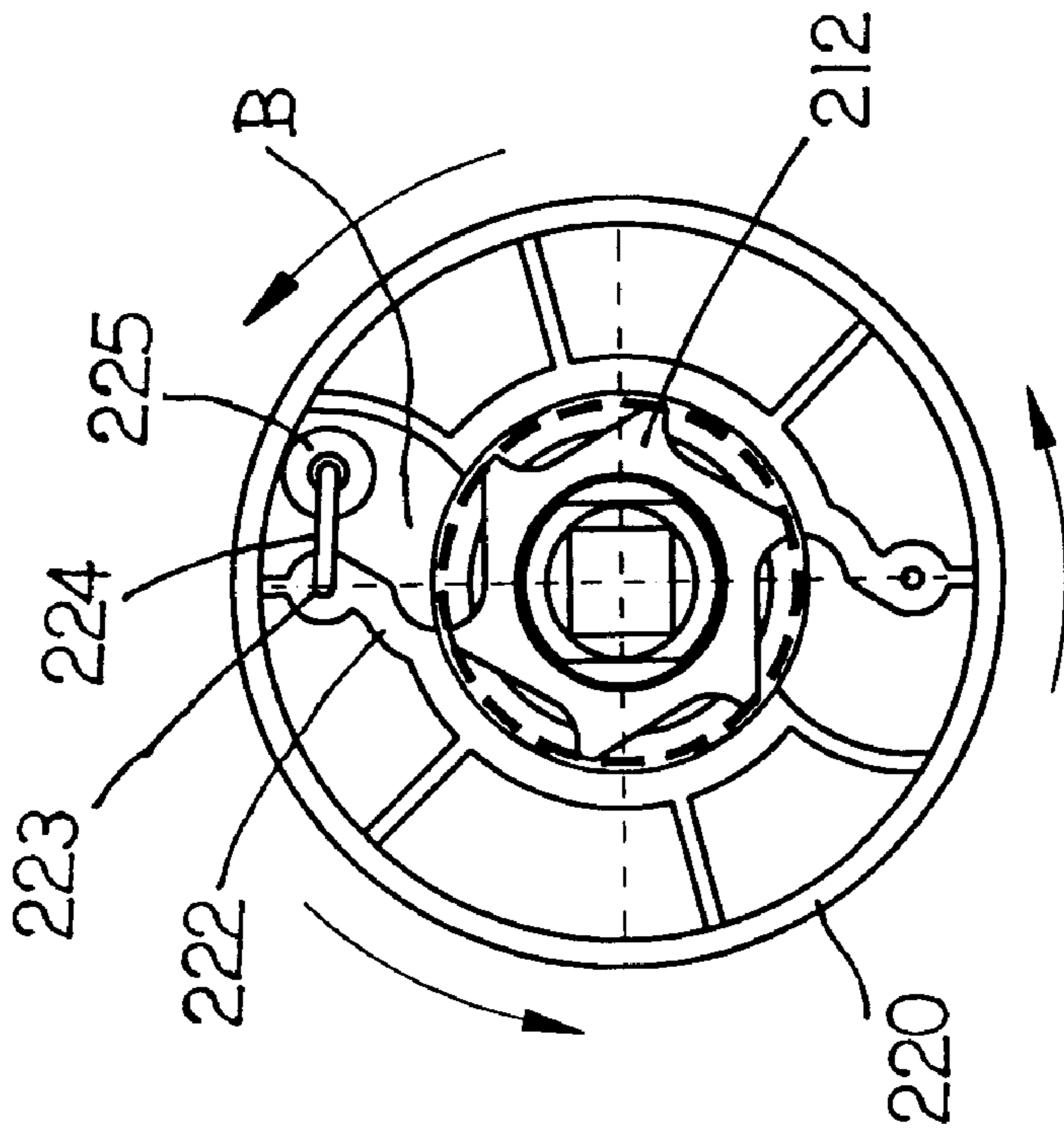


FIG. 8

ROLLER SUNSHADE FOR MOUNTING ON CAR ROOF

BACKGROUND OF THE INVENTION

The present invention relates to a roller sunshade for mounting on a car roof, and more particularly to a roller sunshade that can be easily mounted on any place on a car roof as needed to provide a shady place during outdoor activities.

Camping, fishing, and travelling have become the most favorite and popular recreational activities among most people in holidays in order to release them from busy work and tense life. In such outdoor activities, it is not always easy for people to find a shady place to escape from the strong sunrays. And, it is very uncomfortable and even harmful to expose to the strong sunrays for a prolonged time. A car equipped with means to provide a shady place would conveniently overcome the difficulty in finding a shady place in outdoors.

There are various types of sunshades for using outdoors. However, such conventional sunshades usually require different tools and a lot of fastening means, such as screws, to lock their four fixing means to two sides of the car roof, (that is, the dripping moldings). Thereafter, the bulky and heavy sunshade is screwed to the fixing means. The above procedure for connecting the conventional sunshade to a car roof in an attempt to provide a shady place is obviously time and labor consuming. And, once the sunshade is fixed to the car roof, it can not be easily dismantled from the car roof. To save troubles, the sunshade is frequently left on the car roof even the car is not used for outdoor recreational activities. The sunshade that is always carried on the car roof would make the car look strange and is subject to shortened usable life due to frequent exposure to the sunshine and rainwater.

Another problem with the conventional sunshade for mounting on a car roof is the sunshade usually has fixed height relative to the roof, and such fixed height would usually conflict with any lamp, antenna seat or luggage rack fixedly mounted on the roof and cause troubles in mounting the sunshade on the roof.

It is therefore tried by the inventor to develop an improved roller sunshade for mounting on a car roof to eliminate the drawbacks existing in the conventional sunshades.

SUMMARY OF THE INVENTION

A primary object of the present invention is to provide a roller sunshade that can be easily and conveniently mounted onto or dismantled from a car roof without the need of any tool.

Another object of the present invention is to provide a roller sunshade that is height-adjustably mounted on a car roof.

A further object of the present invention is to provide a roller sunshade for mounting on a car roof, in which a sunshade cloth thereof can be pulled out and easily locked to any desired extended position.

To achieve the above and other objects, the present invention mainly includes more than one adhering sucker mechanism and an automatic sunshade winding mechanism. The adhering sucker mechanism can adhere to any point on the car roof by vacuum suction and each includes from bottom to top a sucker main body, a fixed seat, a height-adjusting fixing bar, a sleeve, a level-adjusting supporting board, a locating block, a bolt, and a connecting board. The automatic sunshade winding mechanism is connected to a

top of the more than one adhering sucker mechanism and includes a sunshade cloth wound on a roller provided with a torsional spring, and a braking mechanism connected to one end of the roller. The braking mechanism includes a rotational sleeve connected to the torsional spring and a one-way ratchet. When the sunshade cloth is quickly pulled out, the rotational sleeve is allowed to rotate rapidly, and when the sunshade cloth is slowly pulled or rewound, the ratchet is stuck by a pawl to prevent the rotational sleeve from moving and the sunshade cloth is locked at the extended position.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 schematically illustrates an example of mounting a roller sunshade of the present invention on a roof of a car;

FIG. 2 is a perspective of an adhering sucker mechanism included in the present invention for fixing the roller sunshade to the car roof;

FIG. 3 is an exploded perspective of the adhering sucker mechanism of FIG. 2;

FIG. 4 is a partially sectional side view of the adhering sucker mechanism of FIG. 2 showing the operation thereof;

FIG. 5 is an exploded perspective of an automatic sunshade winding mechanism of the present invention, a part thereof is cut away to show an internal structure thereof;

FIG. 6 is an exploded perspective of rotational sleeve and set pin of the automatic sunshade winding mechanism for automatically locking a sunshade cloth to a desired extended position;

FIG. 7 is an end view of the rotational sleeve and the set pin in an assembled state with the set pin being locked in place by a weighted pawl to stop the rotational sleeve from moving; and

FIG. 8 is an end view similar to FIG. 7 with the weighted pawl being thrown beyond the set pin for the rotational sleeve to rotate freely.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Please refer to FIGS. 1 and 2. The present invention relates to a roller sunshade for mounting on a car roof (A). The roller sunshade mainly includes more than one set of adhering sucker mechanism **100** and an automatic sunshade winding mechanism **200**. In the following description, only one set of the adhering sucker mechanism **100** is illustrated and described. The adhering sucker mechanism **100** can be firmly attached by vacuum suction to any desired position on the car roof (A) and the automatic sunshade winding mechanism **200** is connected to a top of the adhering sucker mechanism **100**. After the automatic sunshade winding mechanism **200** is fixed above the car roof (A) by means of the adhering sucker mechanism **100**, a shade cloth **201** may be pulled out from the automatic sunshade winding mechanism **200** (see FIG. 5) to provide a shady place for use outdoors.

FIGS. 2, 3 and 4 give more details about the adhering sucker mechanism **100**. As shown, the adhering sucker mechanism **100** each includes from bottom to top a sucker main body **10**, a seat **20**, a height-adjusting fixing bar **30**, a sleeve **40**, a level-adjusting supporting board **50**, a locating block **60**, a bolt **70**, and a connecting board **80**.

The sucker main body **10** has a handling bar **11** provided at an outer side thereof. When the adhering sucker mechanism **100** is positioned on the car roof (A) and the handling

bar **11** is pivotally turned downward to a position indicated by the broken line in FIG. 4, a rubber concave disc portion **12** provided at a bottom of the main body **10** is upward pulled to vacuumize a space above the car roof (A) closed by the disc portion **12**, causing the main body **10** to firmly and tightly adhere to the car roof (A) by vacuum suction without the risk of unexpectedly loosening from the roof (A). To remove the sucker main body **10** from the roof (A), simply pivotally turn the handling bar **11** upward to a position indicated by the solid line in FIG. 4. At this point, the vacuum state of the space between the rubber disc portion **12** and the roof (A) is released and the main body **10** can be easily removed from the roof (A). This structure allows the sucker main body **10** of the adhering sucker mechanism **100** to be freely mounted onto or removed from any position on the car roof (A) at any time without using any tool and is therefore very convenient for use.

The seat **20** of the adhering sucker mechanism **100** is fixedly centered on a top of the sucker main body **10** and has a top central insertion opening **21**. The insertion opening **21** is preferable a polygonal opening. In the illustrated drawings, the insertion opening **21** is a pentagonal opening. A small hole **22** is provided on a wall of the seat **20** for a locating pin **23** to sideward insert into the seat **20** via the small hole **22**.

The height-adjusting fixing bar **30** has a configuration matching with that of the insertion opening **21**, so that it can be stably and firmly inserted into the insertion opening **21**. At least an upper and a lower locating holes **31** and **32**, respectively, are provided on a wall of the fixing bar **30** to horizontally extend into the fixing bar **30**. When the fixing bar **30** is inserted into the insertion opening **21** of the seat **20**, the locating pin **23** may be extended through the small hole **22** and into either the upper or the lower locating hole **31** or **32**, so that the fixing bar **30** is firmly retained to the seat **20** and projects from the seat **20** by different height determined by the upper or the lower hole **31** or **32**. When the fixing bar **30** is inserted in the seat **20** with the locating pin **23** extended into the lower locating hole **32**, the automatic sunshade winding mechanism **200** may be mounted at a high position relative to the car roof (A) without being obstructed by lamp, antenna seat or luggage rack on the roof (A). A top of the fixing bar **30** forms a concave surface **33**. And, an internally threaded hole **34** is centered at the concave surface **33**.

The level-adjusting supporting board **50** includes a downward curved central area **51** protruded from a bottom surface of the supporting board **50**. The curved central area **51** has a contour matching with that of the concave top surface **33** of the fixing bar **30**. Therefore, the curved central area **51** is allowed to slidably move in the concave top surface **33** and accordingly allows adjustment of the supporting board **50** in its horizontal position relative to the roof (A). And, the curved central area **51** is provided with a lengthwise long hole **52**.

The locating block **60** has a curved bottom **61** that has a contour matching with that of the curved central area **51** of the supporting board **50**. Therefore, the locating block **60** could be positioned in the curved central area **51** with its bottom **61** fitly contacting with the central area **51**. And, the locating block **60** has a vertical central hole **62** that is so sized that the sleeve **40** could be disposed therein.

The bolt **70** has a top flange **71** and could be tightly screwed into the internally threaded hole **34** on the top of the fixing bar **30**.

As can be clearly seen from FIG. 4, the sleeve **40** has an overall length larger than a total thickness of the locating block **60** and the supporting board **50**. Whereby when the locating block **60** is disposed in the curved central area **51** of the supporting board **50** with the sleeve **40** extended through the central hole **62** and the long slot **52**, a lower end of the sleeve **40** would abut against the concave top surface **33** of the fixing bar **30** and an upper end of the sleeve **40** would slightly project from a top of the locating block **60**. And whereby when the bolt **70** is extended through the central hole **62** of the locating block **60** and the long slot **52** of the supporting board **50** to screw into the internally threaded hole **34** on the top of the fixing bar **30**, the top flange **71** of the bolt **70** would finally abut against the upper end of the sleeve **40** projected from the locating block **60**. This design allows a clearance (C) to always exist between the curved central area **51** of the supporting board **50** and the concave top surface **33** of the fixing bar **30**. With the existence of the clearance (C), the curved central area **51** is allowed to freely slidably move in the concave surface **33**. Whereby, when the disc portion **12** of the adhering sucker mechanism **100** is adhered by vacuum suction to an inclined instead of a plane surface on the roof (A), the supporting board **50** can be easily adjusted to a suitable angle of inclination relative to the roof (A) to maintain it in a horizontal position.

As shown in FIG. 3, the connecting board **80** is connected to the supporting board **50** by fastening means (not shown), such as screws, after other components **10**, **20**, **30**, **40**, **50**, **60**, and **70** of the adhering sucker mechanism **100** have been fully assembled.

Please now refer to FIGS. 1, 5, 6 and 7. The automatic sunshade winding mechanism **200** includes a housing having a roller fixed therein, a long sunshade cloth **201** wound on a roller, and a torsional spring **203** mounted inside the roller to produce a torsional force to allow outward pulling and inward rewinding of the sunshade cloth **201** from and around the roller. The automatic sunshade winding mechanism **200** is mounted on a top of the adhering sucker mechanism **100** by, for example, sliding a rail **202** provided at a bottom of the housing onto the connecting board **80** and then using fastening means, such as screws (not shown), to lock the sunshade winding mechanism **200** to the adhering sucker mechanism **100**.

The winding of the sunshade cloth **201** around the roller having the torsional spring **203** is a known skill and is not repeated herein. However, to allow the sunshade cloth **201** to be outward pulled or inward rewound and locked to any desired extended position at any time for use at different occasions, the automatic sunshade winding mechanism **200** of the present invention is particularly provided with a brake mechanism.

The brake mechanism mainly includes a set pin **210** and a rotational sleeve **220**. The set pin **210** has a diametrically expanded disc **211** provided at one end thereof. The disc **211** may close one end (it is the right end in the illustrated drawing) **204** of the housing of the automatic sunshade winding mechanism **200** for the set pin **210** to fixedly locate in the housing. And a one-way ratchet **212** is formed at an inner side of the disc **211** around the set pin **210**. The rotational sleeve **220** is connected to the torsional spring **203**. Thus, whenever the sunshade cloth **201** is pulled out or rewound back, the rotational sleeve **220** is brought by the torsional spring **203** to rotate very rapidly. The rotational sleeve **220** provides a central supporting space **221** in which

5

the ratchet 212 is received. An extension arm 222 outward projects from a point on a peripheral wall of the supporting space 221 and a small hole 223 is provided near an outer end of the extension arm 222. A U-shaped retaining means 224 having two legs is pivotally connected to the extension arm 222 by inserting one leg thereof into the small hole 223. A weighted pawl 225 is mounted around the other leg of the U-shaped retaining means 224 and is allowed to freely swing within a curved space (B) generally contained between the extension arm 222 and the ratchet 212, as can be clearly seen from FIGS. 7 and 8.

As shown in FIG. 8, when the sunshade cloth 201 is quickly pulled or rewound, the rotational sleeve 220 is caused to rotate rapidly to generate a centrifugal force larger than a gravity of the weighted pawl 225 connected to the outer end of the extension arm 222 via the U-shaped retaining means 224. At this point, the weighted pawl 225 is thrown outward to a position beyond the ratchet 212, and therefore the rotational sleeve 220 is allowed to keep rotating unimpededly and the sunshade cloth 201 be freely pulled or rewound. On the contrary, when the sunshade cloth 201 is slowly pulled or rewound, the generated centrifugal force of the rotational sleeve 220 is smaller than the gravity of the weighted pawl 225. At this point, the weighted pawl 225 naturally depends from the extension arm 222 and locates at an inner portion of the curved space (B), that is, between two teeth of the one-way ratchet 212, to stop the rotational sleeve 220 from moving any further. Accordingly, the sunshade cloth 201 is locked in place at its extended position.

With the above arrangements, the roller sunshade for mounting on a car roof according to the present invention has simple structure and can be easily mounted on or dismantled from any place on the car roof. And, the sunshade cloth thereof can be freely pulled or rewound and locked to any desired extended position. The present invention is therefore an improved product over the conventional sunshades for cars and is practical for use.

What is claimed is:

1. A roller sunshade for mounting on a car roof, comprising more than one adhering sucker mechanism and an automatic sunshade winding mechanism;

each said adhering sucker mechanism comprising:

- a sucker main body having a handling bar provided at an outer side thereof;
- a seat being fixedly centered at a top of said sucker main body and being provided at a top center with a polygonal insertion opening and on a peripheral wall with a small through hole for a locating pin to extend therethrough;
- a height-adjusting fixing bar having a configuration matching with that of said polygonal insertion opening on said seat for stably and firmly inserted in said polygonal opening, said fixing bar having a concave top surface with an internally threaded hole centered thereat;
- a sleeve being disposed on said concave top surface of said fixing bar;
- a level-adjusting supporting board being supporting on the top of said fixing bar and having a downward curved central area protruded from a bottom surface thereof, said downward curved central area having a configuration matching with that of said concave top surface of said fixing bar and therefore being able to freely slidably move in said concave top surface of said fixing bar, and a slot being formed in said curved central area for said sleeve to upward extend therethrough;

6

a locating block being positioned in said downward curved central area of said supporting board and having a curved bottom matching with and therefore fitly contacting with said downward curved central area, and a through hole being formed on said locating block for said sleeve to upward extend therethrough and project therefrom;

a bolt being downward screwed through said locating block, said curved central area of said supporting board, and said sleeve into said internally threaded hole on the top of said fixing bar, said bolt having a top flange against which an upper end of said sleeve projected from said locating block abuts; and

a connecting board being screwed to a top of said supporting board; and

said automatic sunshade winding mechanism comprising:

a housing into which a roller having a long sunshade cloth wound thereon and a torsional spring mounted therein is mounted, said housing having a bottom rail with which said connecting board of a respective said adhering sucker mechanism is slidably engaged to allow said automatic sunshade winding mechanism to mount on a top of said respective adhering sucker mechanism; and

a braking mechanism; said braking mechanism comprising:

a rotational sleeve being connected to one end of the roller and the torsional spring in said housing, said rotational sleeve having an outer end providing a central supporting space, and an extension arm outward projected from a peripheral wall of said supporting space; and

a set pin having a diametrically expanded disc provided at an outer end thereof, said disc having a one-way ratchet provided at an inner side thereof around said set pin, said set pin being inserted into said rotational sleeve with said one-way ratchet located in said central supporting space and said disc closing one lateral end of said housing.

2. A roller sunshade for mounting on a car roof as claimed in claim 1, wherein said height-adjusting fixing bar is provided on a wall thereof with at least adequately spaced upper and lower holes, and said locating pin extended through said hole on said seat may be further extended into either said upper or said lower holes on said fixing bar to lock said fixing bar in said seat with said concave top surface projected from said seat by different height.

3. A roller sunshade for mounting on a car roof as claimed in claim 1, wherein said slot formed on said curved central area of said supporting board is a long slot having a size just for said sleeve to extend therethrough.

4. A roller sunshade for mounting on a car roof as claimed in claim 1, wherein said hole on said locating block is centered at said locating block and is sized to just for said sleeve to extend therethrough.

5. A roller sunshade for mounting on a car roof as claimed in claim 1, wherein said sleeve has an overall height larger than a total thickness of said locating block and said supporting board, such that a clearance is allowed to exist between said concave top surface of said fixing bar and said downward curved central area of said supporting board for said curved central area to freely slidably move on said concave top surface of said fixing bar.

6. A roller sunshade for mounting on a car roof as claimed in claim 1, wherein said extension arm projected from the wall of said supporting space on said rotational sleeve has a small hole formed near an outer end thereof, and a U-shaped

7

retaining means having two legs being connected to said extension arm by extending one leg thereof through said small hole, said U-shaped retaining means being connected at the other leg to a weighted pawl, such that said weighted pawl is allowed to free swing within a curved space between said extension arm and said one-way ratchet mounted in said supporting space.

7. A roller sunshade for mounting on a car roof as claimed in claim 6, wherein said rotational sleeve is caused to rotate rapidly when said sunshade cloth is quickly pulled or rewound and therefore generates a centrifugal force larger

8

than a gravity of said weighted pawl, causing said weighted pawl to be thrown to a position beyond said ratchet.

8. A roller sunshade for mounting on a car roof as claimed in claim 6, wherein said sunshade cloth can be slowly pulled or rewound to cause said rotational sleeve to rotate slowly and generate a centrifugal force smaller than the gravity of said weighted pawl, causing said weighted pawl to naturally depend from said extension arm and locate between two teeth of said ratchet to stop said rotational sleeve from moving any further.

* * * * *